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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/696,232

10/26/2000

Mitsuru Ishikawa

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22852

7590

10/11/2007

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EXAMINER

OLSEN, ALLAN W

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

10/11/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/696,232	Applicant(s) ISHIKAWA ET AL.	
	Examiner Allan Olsen	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 14 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 1418 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 27, 2007 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,284,149 issued to Li et al. (hereinafter, Li).

Li teaches a method of etching a layer of BCB (16, 20) that overlies a protective film of SiN_x (column 11, lines 15-16). BCB is the cured polymer of divinyl siloxane-benzocyclobutene. BCB contains SiO₂, C and H and has a dielectric constant of less than 3 (see figure 4 and column 4, lines 1-17). Li teaches etching the BCB with plasma derived from a gas mixture comprising 3 sccm of C₄F₈ and 45 sccm of N₂ (Table 1,

Art Unit: 1763

column 11, lines 34-35). Li teaches a patterned resist (42, 44, 18) overlies the BCB.

When the via of Li's FIG. 6 is etched, overlying layer 18 functions as a mask or etching resist layer. The material of resist layer 18 is the same as the etch stop layer 14.

Therefore the selectivity between the BCB and the resist layer is >2 (for example 35:1 in the case of a nitride resist, column 11, line 57). Also, see figure 5, 6, 17 or 18 and column 7, lines 13-31.

Claim 14 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,355,572 issued to Ikegami.

Ikegami teaches a method of etching a low- k , organic, spin-on-glass that overlies a protective oxide film. Ikegami teaches etching organic-SOG with plasma derived from a gas mixture comprising N_2 , CF_4 and Ar (column 5, lines 6-7). Ikegami teaches etching the organic SOG through a patterned resist. Ikegami teaches using more N_2 than CF_4 to control the etch profile (see figure 3). See also: column 1, lines 44-55; column 2, lines 8-24; column 3, lines 46-55; column 4, lines 14-17; column 5, lines 6-39; and, column 6, lines 20 -26.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,355,572 issued to Ikegami.

Ikegami teaches a method of etching a low-k, organic, spin-on-glass that overlies a protective oxide film. Ikegami teaches etching the organic-SOG with plasma derived from a gas mixture comprising N₂, CF₄ and Ar (column 5, lines 6-7). Ikegami teaches etching the organic SOG through a patterned resist. Ikegami teaches using more N₂ than CF₄ (see figure 3). See also: column 1, lines 44-55; column 2, lines 8-24; column 3, lines 46-55; column 4, lines 14-17; column 5, lines 6-39 and column 6, lines 20-26.

Ikegami does not teach an etch selectivity of at least 2.

It would have been obvious to one skilled in the art to carry out the method of Ikegami in a manner that would provide an etch selectivity of at least 2 because Ikegami teaches that one objective is to increase the etching selectivity. Therefore, it would have been obvious for one skilled in the art to optimize the process conditions to maximize the etching selectivity. For example, figure 3 of Ikegami demonstrates that increasing the amount of N₂ provides a means of increasing the etching selectivity.

Response to Arguments

Applicant's arguments filed August 27, 2007 have been fully considered but they are moot in view of the new grounds of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M, W and F: 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink that reads "Allan Olsen". The signature is written in a cursive, flowing style.

Allan Olsen
Primary Examiner
Art Unit 1763